

~~SECRET~~

INTELLIGENCE MEMORANDUM

THE PROGRAM FOR CONSTRUCTION
OF MACHINE BUILDING PLANTS
IN THE EASTERN USSR
UNDER THE SIXTH FIVE YEAR PLAN

CIA/RR IM-449

15 April 1957

WARNING

THIS MATERIAL CONTAINS INFORMATION AFFECTING THE
NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE
MEANING OF THE ESPIONAGE LAWS, TITLE 18, USC, SECS.
793 AND 794, THE TRANSMISSION OR REVELATION OF
WHICH IN ANY MANNER TO AN UNAUTHORIZED PERSON IS
PROHIBITED BY LAW.

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

~~SECRET~~

S-E-C-R-E-T

FOREWORD

This memorandum presents information on the Soviet program for the construction of a large number of new machine building plants in the Eastern USSR under the Sixth Five Year Plan (1956-60) as originally announced. The program is examined, as comprehensively as current information permits, within the larger framework of the over-all capital allocations under the Sixth Five Year Plan and the regional distribution of the Soviet machine building industry.

While this memorandum was in preparation, the Supreme Soviet of the USSR, meeting in February 1957, approved a decision to cut back the 1957 planned economic goals. The impact this decision may have on the five year program of construction treated in this memorandum is not known at this time. Because Soviet policy regards machine building as the leading branch of industry and as a key to the continued rapid growth of the Soviet economy, it is believed, however, that the program for construction of machine building plants in the Eastern USSR may not be substantially altered.

The institutional and economic factors most likely to affect implementation of the program, even if the program should be revised, are considered in this memorandum. In addition, new machine building plants, planned and actually under construction in the Eastern USSR, are located and compared with existing centers of machine building in this area.

- iii -

S-E-C-R-E-T

S-E-C-R-E-T

CONTENTS

	<u>Page</u>
Summary	1
I. Regional Distribution of Facilities for Production . . .	3
II. Capital Allocations in the Machine Building Industry . .	4
III. Effect of the Program for New Construction in the Eastern USSR on the Distribution of the Soviet Machine Building Industry	4
IV. Construction of Machine Building Plants in the Eastern USSR	6
1. Previous Policy	6
2. Justification of Current Policy	7
3. Distribution of New Plants by Economic Region	9
4. Major Types of Machinery Required in the Eastern USSR	10
5. Existing and Future Centers of Machine Building . . .	12
6. Possible Causes of Delay in the Construction Program	15

Appendixes

Appendix A. Economic Regions of the USSR	23
Appendix B. Soviet Ministries Probably Concerned with the New Machine Building Plants Announced for the Eastern USSR	27
Appendix C. Tentative Classification of the Machine Building Industry in the USSR	29
Appendix D. Determination of the Location of Machine Building Plants in the USSR	33
Appendix E. Centers of Machine Building in the Eastern USSR Under the Fifth Five Year Plan (1951-55) . . .	35
Appendix F. Some Machine Building Plants to Be Built in the Eastern USSR Under the Sixth Five Year Plan (1956-60)	37

- v -

S-E-C-R-E-T

S-E-C-R-E-T

	<u>Page</u>
Appendix G. Source References	39

Tables

1. Economic Factors Determining the Location of Machine Building Plants in the USSR	34
2. Centers of Machine Building in the Eastern USSR Under the Fifth Five Year Plan (1951-55).	35
3. Some Machine Building Plants to Be Built in the Eastern USSR Under the Sixth Five Year Plan (1956-60)	37

Illustrations

	<u>Following Page</u>
Figure 1. Comparison of Relative Increases in Capital Investments in the Entire USSR and in Selected Regions of the Eastern USSR Under the Sixth Five Year Plan, 1956-60 (Chart)	4
Figure 2. Major Centers of Machine Building in the USSR, 1955 (Map)	6
Figure 3. New Machine Building Plants in the Eastern USSR, 1956-60 (Map)	16

- vi -

S-E-C-R-E-T

CIA/RR IM-449
(ORR Project 34.1638)

S-E-C-R-E-T

THE PROGRAM FOR CONSTRUCTION OF MACHINE BUILDING PLANTS
IN THE EASTERN USSR UNDER THE SIXTH FIVE YEAR PLAN*
(1956-60)

Summary

The program for capital investment in the machine building industry of the USSR under the Sixth Five Year Plan (1956-60), like the over-all program for investment in the economy of the USSR, places major emphasis on the development of the Eastern USSR.** About one-half of the 990 billion rubles which are to be invested in the Soviet economy under the Sixth Five Year Plan are allocated to the Eastern USSR. Paralleling this over-all capital allocation, almost one-half of the capital allocations of the Soviet machine building ministries are to be invested in the construction of new enterprises in the Eastern USSR. The heaviest concentration of new machine building plants in the Eastern USSR is planned for southern Siberia and northern Kazakhstan.

The current program, calling for construction of about 100 machine building plants in the Eastern USSR, is the most ambitious planned effort of the Soviet machine building industry in this area to date. Although the large-scale movement of the machine building industry to the east during World War II marked a major step in the same direction, much of that movement was improvised rather than planned, and there was a shift of the machine building industry back to the Western USSR after 1945.

* The estimates and conclusions contained in this memorandum represent the best judgment of ORR as of 15 February 1957.

** The terms Eastern USSR and Western USSR are used in this memorandum to designate the areas usually referred to in Soviet publications as the Eastern regions of the USSR and the Western regions of the USSR. (The term region in this memorandum refers to the economic regions defined and numbered on CIA Map 13702 (4-55), USSR: Administrative Divisions and Economic Regions, January 1955.) For a discussion of economic regions in the USSR and a list of the major administrative-territorial divisions included in the Eastern USSR, see Appendix A.

S-E-C-R-E-T

S-E-C-R-E-T

Machine building enterprises in the Western USSR may be expected to supply most of the machinery produced in the USSR for some time to come, even though the current Plan provides for the construction of only about one-half as many new plants in the Western USSR as in the Eastern USSR. The pattern of capital investments under the Sixth Five Year Plan, however, opens the way for a more rapid rate of growth of machine building in the Eastern USSR than in the Western USSR.

The types of civilian machinery that will be needed most in order to meet the planned industrial and agricultural development of the Eastern USSR under the Sixth Five Year Plan include heavy machinery for the metallurgical, coal, and construction industries; equipment for the power engineering, petroleum, and chemical industries; and agricultural machinery. The greater the degree of self-sufficiency of the Eastern USSR in production of these types of machinery, all of which require relatively large unit inputs of metal, the closer the USSR will come to the goal of eliminating long hauls of machinery by rail from the Western USSR. Apart from domestic economic considerations, the strategic importance of machine building in the Eastern USSR, not only with respect to military defense but also with respect to Soviet markets in Asia, is acknowledged by Soviet economists.

In addition to the entrenched position of the machine building industry in the Western USSR, there are economic and institutional factors which militate against a rapid, eastward shift of the industry. These factors include a reluctance on the part of the ministries in Moscow to build plants in remote eastern locations, difficulties in coordinating the planning and construction of new industrial areas in the Eastern USSR, the longer time required to put new facilities for production into operation in the Eastern USSR compared with the Western USSR, and the shortage of skilled labor in the Eastern USSR. The USSR probably is capable of fulfilling the planned program for construction of machine building plants in the Eastern USSR. The problems which have been noted must be solved, however, before the planned objectives can be achieved.

- 2 -

S-E-C-R-E-T

S-E-C-R-E-T

I. Regional Distribution of Facilities for Production.

The directives of the Soviet Sixth Five Year Plan (1956-60), in line with previous Plan directives, establish a policy of distributing facilities for production more rationally throughout the USSR and of bringing industrial centers closer to the consumer and to sources of raw materials, fuel, and power, thus eliminating long hauls and crosshauls by rail. Economic regions are to specialize in those industries in which they have comparative economic advantages on a national scale. At the same time, other branches of the national economy within each economic region are to be developed to the extent that they will meet regional requirements. Official Soviet statements claim that new facilities for production are to be distributed throughout the country in such a way as to ensure the most efficient use of labor and natural resources. 1/*

With respect to improving the distribution of facilities for production, the primary goal of the Sixth Five Year Plan is to increase the role of the Eastern USSR in the national economy by increasing the rate of its industrial development and by intensifying the exploitation of its natural resources.

Under the Fifth Five Year Plan (1951-55) the industrial product of the Eastern USSR increased only 77 percent, whereas the industrial product of the Western USSR increased 88 percent. Under the Sixth Five Year Plan, therefore, the Eastern USSR, especially those economic regions slated for the most intensive industrialization, will receive greater percentage increases in capital investments than will the USSR as a whole, as shown in the chart in Figure 1.** About one-half of the 990 billion rubles which are to be invested in the Soviet economy under the Sixth Five Year Plan are allocated to the Eastern USSR. 2/

Achievement of the rapid industrial development of the Eastern USSR is planned through the construction of industrial complexes consisting of heavy industrial enterprises which consume large amounts of electric power and fuel. These enterprises include ferrous and nonferrous metallurgical plants, electric power stations, oil refineries, machine building plants, chemical plants, and construction materials enterprises. 3/

* For serially numbered source references, see Appendix G.

** Following p. 4, below.

S-E-C-R-E-T

S-E-C-R-E-T

In order to carry out the ambitious program of capital construction in the Eastern USSR, more than one-half of the capital investments of the construction ministries and of the Ministry of the Construction Materials Industry are allocated to the Eastern USSR. 4/

II. Capital Allocations in the Machine Building Industry.

The regional pattern of capital allocations in the machine building industry of the USSR under the Sixth Five Year Plan is similar to the regional pattern of capital allocations for the economy as a whole. Almost one-half of the capital investments of the machine building ministries* are allocated to the construction of new enterprises in the Eastern USSR. 5/ Outlays for new capital equipment and for the expansion of existing machine building plants throughout the entire USSR, as well as outlays for construction of new machine building plants in the Western USSR, must come out of the remaining funds for capital investments in the machine building industry. It is obvious, therefore, that the allocations to new machine building plants in the Eastern USSR represent the major item in the investment program of the Soviet machine building industry. It follows that capital investments available for construction of new plant capacity in the Western USSR must be less than those for construction of new plants in the Eastern USSR.

Approximately two-thirds of the new machine building plants planned for construction under the Sixth Five Year Plan are to be located in the Eastern USSR. Because approximately 100 new machine building plants will be constructed in the Eastern USSR, 6/ about 50 new machine building plants probably will be located in the Western USSR. It is not possible to determine at this time how many of the approximately 150 new Soviet machine building plants may be carryover construction projects from the Fifth Five Year Plan, how many are scheduled for completion by 1960, and how many may be only begun under the Sixth Five Year Plan.

III. Effect of the Program for New Construction in the Eastern USSR on the Distribution of the Soviet Machine Building Industry.

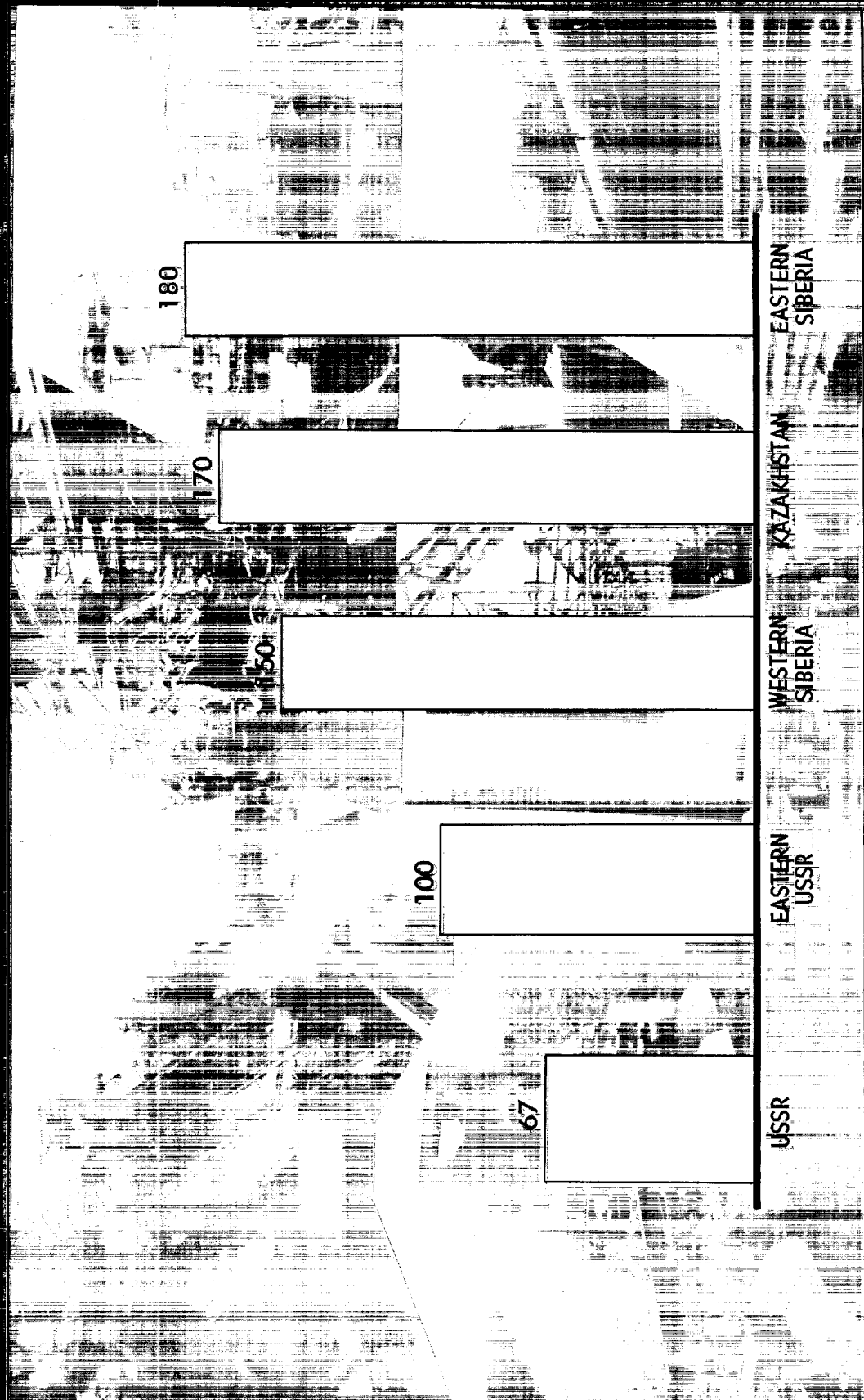
The high rates in increase announced for production of machinery for nonmilitary (grazhdanskiy) purposes in economic regions of the Eastern USSR under the Sixth Five Year Plan reflect the influence of the program

* For a discussion of the machine building ministries probably concerned with this program, see Appendix B. For a tentative classification of the Soviet machine building industry by type of machinery, see Appendix C.

SECRET

FIGURE 1

**COMPARISON OF RELATIVE INCREASES
IN CAPITAL INVESTMENTS IN THE ENTIRE USSR
AND IN SELECTED REGIONS OF THE EASTERN USSR
UNDER THE SIXTH FIVE YEAR PLAN, 1956-60**



SECRET

S-E-C-R-E-T

for construction of new plants. The increases in production of such machinery under the Sixth Five Year Plan are as follows* 7/:

<u>Region</u>	<u>1960 Production as Percent of 1954 Production</u>
Eastern USSR:	
East Siberia and Far East	900
West Siberia, Kazakhstan, and Central Asia	260
Western USSR:	
Urals and Volga	200
South, West, Northern Caucasus, and Trans- caucasus	Less than 200
Central, North, and Northwest	Less than 200
Total USSR	Approximately 200

Despite the higher rate in growth of production planned for the Eastern USSR, the machine building industry in the Western USSR accounted for such a large share of the output of the Soviet machine building industry in 1955, as shown in the map in Figure 2** and in the tabulation below, 8/ that the Western USSR may be expected to produce the bulk of Soviet machinery for some time to come.

<u>Area</u>	<u>Percent of Total Output of Machinery in 1955</u>
Eastern USSR (exclusive of Urals Region)	12
Western USSR (exclusive of Urals Region)	75
Urals Region***	13
Total USSR	<u>100</u>

* This grouping of economic regions is as presented by A.G. Omarovskiy of the Economic Scientific Research Institute (Nauchno-Issledovatel'skiy Ekonomicheskii Institut), State Planning Commission (Gosplan), USSR. For an explanation of these economic regions, see Appendix A.

** Following p. 6, below.

*** The Urals Region is shown separately because it appears to be in a state of transition as far as regional grouping of the machine building

S-E-C-R-E-T

IV. Construction of Machine Building Plants in the Eastern USSR.

1. Previous Policy.

By 1955 the Eastern USSR (including the Urals Region -- Region VIII*) increased its share in the total gross output of the machine building industry to about 25 percent as compared with about 20 percent before World War II (based on the prewar concept of the Eastern USSR**). No plan previous to the Sixth Five Year Plan envisaged so ambitious a program for locating new machine building plants or for increasing production of machinery in the Eastern USSR. Although the annual Plan for 1941 did provide for locating at least 18 of the 26 new machine building plants enumerated in the Plan in the Eastern USSR, the majority of these plants were to be built in the Volga and Urals Regions. Furthermore, the 1941 Plan was never completed, and the movement of machine building plants to the east which followed the German attack in June 1941 was largely improvised. During World War II the Eastern USSR as then constituted accounted for an abnormally large share of machine building.

In the postwar period of reconstruction, there was a decided shift of the Soviet machine building industry back to the west. Plants which had been damaged or destroyed were rebuilt along technically improved lines. In addition, new machine building plants were built in the Western USSR, and some of the plants which had been evacuated to the east during the war were moved back to the west. Machine building in the Eastern USSR received no special attention in the directives of the Fifth Five Year Plan, which, on the contrary, singled out the Baltic republics of Latvia, Estonia, and Lithuania for intensive development of machine building. 2/

industry is concerned. Before the Sixth Five Year Plan the Urals Region was invariably included in the Eastern USSR, thus giving the Eastern USSR the relative weight in 1955 of about 25 percent of the total gross output of machinery. Recent Soviet statements on machine building under the Sixth Five Year Plan, however, suggest that the Urals Region may no longer be grouped under the Eastern USSR in long-term planning.

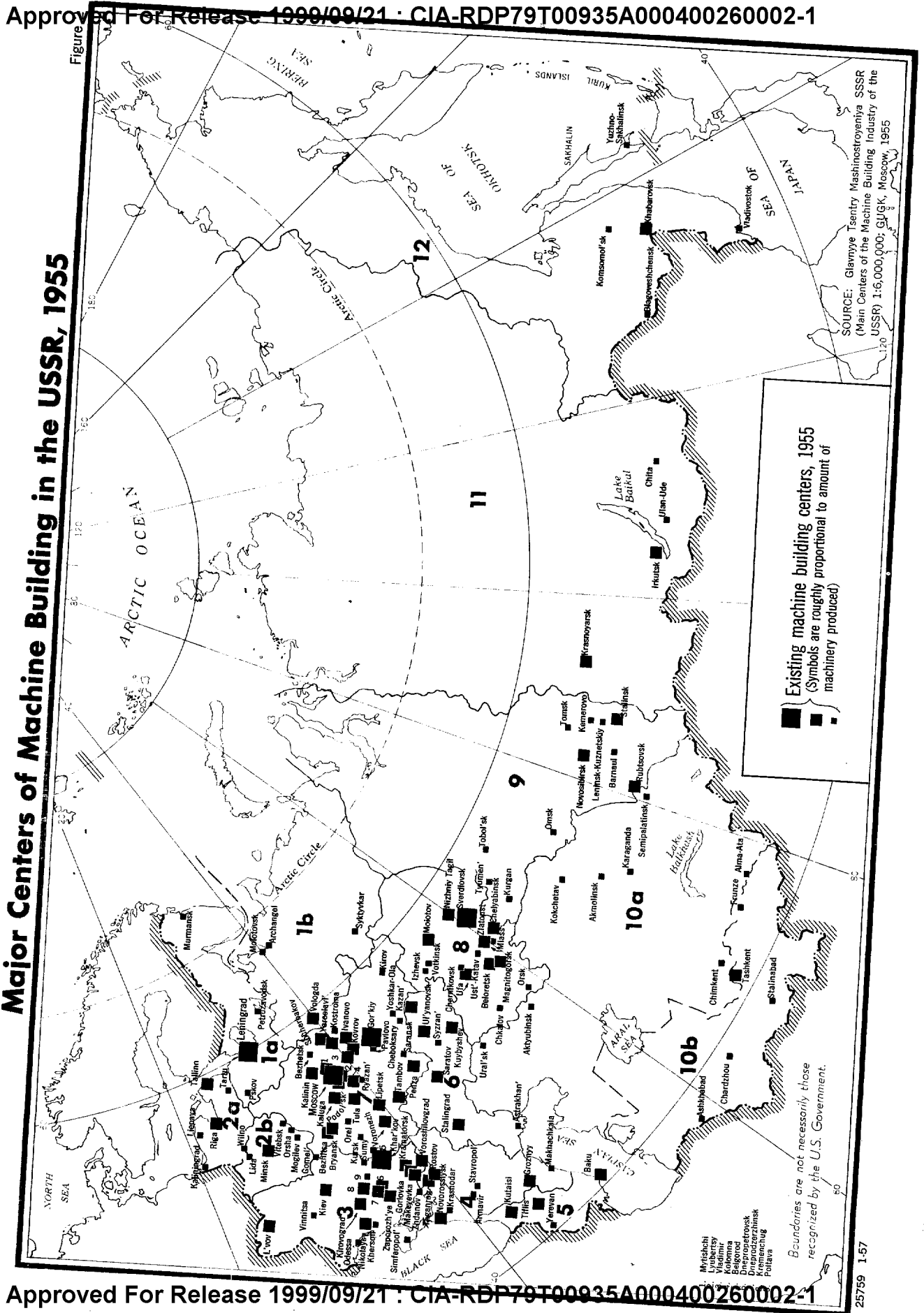
* Roman numerals following the names of economic regions indicate the number of the region as shown on CIA Map 13702 (see the second footnote on p. 1, above).

** Including the Volga (VI) and Urals Regions. For additional comments on changes in the regional composition of the USSR, see Appendix A.

- 6 -

S-E-C-R-E-T

Major Centers of Machine Building in the USSR, 1955



S-E-C-R-E-T

If World War II is viewed as a major disruption of the planned proportional and regional development of the Soviet economy and the years of the Fourth Five Year Plan (1946-50) and the Fifth Five Year Plan (1951-55) are regarded as periods of economic reconstruction and consolidation, the Sixth Five Year Plan may be considered as marking a return to the policy of planned large-scale development of the Eastern USSR foreshadowed in the Third Five Year Plan (1938-42) and elaborated in the Annual Plan for 1941. There are, however, limits to this analogy between the Third and Sixth Five Year Plans because many conditions have changed since 1938. Current Soviet justification of the policy of industrializing the Eastern USSR (and Soviet economists refer to machine building as the leading branch of industry) reflects many of the earlier economic arguments as well as subsequent developments, in particular, the economic role of the USSR in Asia.

2. Justification of Current Policy.

Writing in a recent issue of the official journal of 4 of the Soviet machine building ministries, V.E. Popov, who favors dividing the Soviet machine building industry at its present stage of development into 3 zones -- the Western, the Ural-Volga, and the Eastern -- lists and discusses the following factors influencing the location of new machine building plants in the Eastern USSR, specifically in Siberia 10/:

- a. The necessity of meeting the demand for machinery in the Eastern USSR and in the "friendly countries" of Asia.
- b. Reduction of costs of production by locating machine building plants near cheap and plentiful sources of power and raw materials.
- c. Reduction of long hauls of machinery which lead to high costs of transportation and to a poor system of distribution.
- d. Integration of the economic regions of the USSR into several more or less self-sufficient zones with "duplicate" machine building industries.

Popov's grouping of the Eastern USSR and the countries of Asia together as consumers of machinery to be produced in the Eastern USSR may reflect a Soviet view that the types of machinery in demand in the industrially backward Eastern USSR and the underdeveloped areas of Asia, both Communist and non-Communist, are similar. The Soviet concept of

- 7 -

S-E-C-R-E-T

S-E-C-R-E-T

"friendly countries" of Asia, as far as exports of machinery are concerned, extends not only to countries of the Sino-Soviet Bloc such as Communist China, North Korea, and Northern Vietnam, but also to such non-Bloc countries as India, Afghanistan, Burma, and Indonesia. 11/

By bringing production of machinery closer to export markets in Asia as well as to domestic markets in the Eastern USSR, the USSR hopes to eliminate the cost of shipping machinery all the way across the USSR. Freight charges for shipping machinery from the Western USSR to the Far East Region (XII), for example, amount to about 20 percent of the price of the machinery. 12/ Machinery produced in the Eastern USSR presumably could be transported overland to Asian countries adjacent to the USSR or, in the case of machinery produced in East Siberia (XI) and the Far East Region,* could be economically shipped from Soviet ports in the Far East to countries of Southeastern Asia.** Such an arrangement might be expected to reduce shipping charges and to shorten the time required for delivery.

The idea of creating several zones which would be nearly self-sufficient in the production of machinery through the establishment of "duplicate" machine building industries is not a purely economic concept but is closely linked with Soviet concepts of strategic defense. A recent Soviet publication issued under the auspices of the Economics Institute (Institut Ekonomiki), Academy of Sciences, USSR (Akademiya Nauk SSSR) states 15/:

The importance of a more uniform distribution of industry is very great from the point of view of strengthening the defense potential of the USSR ... The fundamental requirements of defense in the distribution of industry are location of enterprises deep within the country and creation of relatively dispersed industrial bases in various parts of the country.

* An official of the Far Eastern Branch of the Academy of Sciences, USSR, recently noted that "the coastal location of the Far East Region has resulted in the development of shipbuilding, ship repair, machine building, and machine tool building industries [in the Far East Region]." 13/
** For example, the Machine Building Plant imeni Kaganovich at Khabarovsk has produced steam turbines for Communist China and Northern Vietnam and in September 1956 was filling an order placed by India. 14/

S-E-C-R-E-T

S-E-C-R-E-T

The greater the importance attached by Soviet planners to these defensive concepts in developing the Eastern USSR, the wider the variety of machine building plants which may be built in the Eastern USSR to offset the possible destruction of machine building plants in other regions of the USSR.

3. Distribution of New Plants by Economic Region.

Soviet announcements indicate that the southern parts of West Siberia (IX) and East Siberia, together with the northern part of Kazakhstan (Xa), will receive most of the new machine building plants to be built in the Eastern USSR under the Sixth Five Year Plan.

Of approximately 100 new machine building plants to be built in the Eastern USSR, 65 will be located in Siberia. 16/ About 20 of these 65 plants will be built in Irkutskaya Oblast, 17/ which, under the Sixth Five Year Plan, probably is destined for the most intensive industrial development of any area in East Siberia. Such major industrial centers as Kurgan, Omsk, Novosibirsk, Tomsk, Barnaul, and Kemerovo already exist in West Siberia; and Krasnoyarsk, Irkutsk, Ulan-Ude, and Chita, in East Siberia.

Fifteen or 20 new machine building plants will be built in Kazakhstan, an area of approximately 2.8 million square kilometers. 18/ The most industrialized regions of Kazakhstan are concentrated in the north and the southwest, around the cities of Ural'sk, Aktyubinsk, Petropavlovsk, Akmolinsk, Pavlodar, Semipalatinsk, Karaganda, and Alma-Ata.

Although the locations of the remaining 15 or 20 machine building plants to be built in the Eastern USSR have not been specifically announced in the Soviet press, presumably the plants will be distributed among the republics of the Central Asia Region (Xb) -- Kirgiz, Tadzhik, Turkmen, and Uzbek -- and the Far East Region.* Recent information suggests that new machine building and metalworking plants are scheduled to be built along the Amur River in the Far East Region and that new facilities for shipbuilding and ship repair will be built in the vicinities of Vladivostok and Nakhodka. 19/

* This residual of 15 or 20 machine building plants to be accounted for elsewhere in the Eastern USSR is so small that it hardly seems possible that the Urals Region, where many new machine building plants may reasonably be expected to be built under the Sixth Five Year Plan, can be included in the Eastern USSR in this instance.

- 9 -

S-E-C-R-E-T

S-E-C-R-E-T

4. Major Types of Machinery Required in the Eastern USSR.

As indicated in Appendix D, decisions regarding the location of various types of machine building plants, when not based predominantly on strategic considerations, are based on economic factors such as the availability and the proximity of raw materials, fuel, electric power, transportation, and the location of consumers.

Because one of the announced purposes of locating new machine building plants in the Eastern USSR is to meet the needs of the economy in that area, the industries which are to be developed most intensively in the Eastern USSR under the Sixth Five Year Plan will be examined briefly. The machine building industry is as dependent on the development of certain other branches of industry for raw materials and fuel or electricity for power as these other branches are dependent on the machine building industry for machinery and equipment.

The Sixth Five Year Plan places major emphasis on the development of such natural resources as ferrous and nonferrous ores, coal, water power, and timber in the Eastern USSR. Although there are a number of plants producing mining equipment in the Eastern USSR, large-scale exploitation of iron ore at Korshunovo in East Siberia, coal at Karaganda and Ekibastuz in Kazakhstan, and bauxite at Turgay in Kazakhstan may require additional plant capacity to produce the various additional types of mining machinery required. In Krasnoyarskiy Kray a special railroad is to be built from Achinsk into densely forested areas where timber-felling and sawmill equipment will be needed. Construction of 3.6-million-kilowatt hydroelectric power stations at Bratsk and Krasnoyarsk in East Siberia, as well as a number of large hydroelectric power stations in Kazakhstan and Central Asia, will require hydroturbines and generators. The construction of large thermal electric power stations -- some of which will have a capacity of over 1 million kilowatts -- in the Kuzbas, northern Kazakhstan, southern Krasnoyarskiy Kray, and Irkutskaya Oblast will require boilers, steam turbines, and generators.

In the processing industries a large number of petroleum refineries, iron and steel plants, aluminum plants, chemical plants, construction material plants, and cellulose and artificial fiber plants are to be built in the Eastern USSR.

- 10 -

S-E-C-R-E-T

S-E-C-R-E-T

In addition to the completion of the Omsk and Irkutsk refineries in Siberia and the Fergana refinery in Uzbek SSR, construction is to begin on at least 4 new oil refineries as follows: 1 in Krasnoyarskiy Kray, 1 in Amurskaya Oblast, and 2 in Kazakhstan at Pavlodar and Chimkent.

Three iron and steel plants, including the West Siberian Iron and Steel Plant, are to be built in Siberia. In Kazakhstan, the Karaganda Iron and Steel Plant is to be enlarged, a ferroalloy plant is to be built at Pavlodar, and the Sokolovka-Sarbay ore concentration plant is to be built in Severo-Kazakhstanskaya Oblast. Three aluminum plants are to be built in Siberia -- 1 in the Kuzbas, 1 in Krasnoyarskiy Kray, and 1 in Irkutskaya Oblast -- and 1 aluminum plant is to be built at Pavlodar in Kazakhstan.

Chemical plants are to be built at Dzhabul in Kazakhstan and at Chardzhou in Turkmen SSR. Construction of the Angren Nitrogenous Fertilizer Plant will begin in Uzbek SSR. Two cement plants will be built in Kazakhstan -- one at Chimkent and another at Semipalatinsk. Cellulose and paper factories are under construction at Bratsk, Baykal, Chuna, and Komsomol'sk-on-Amur, and two large woodworking combines will be built at Yeniseysk.

In addition, the Sixth Five Year Plan calls for extending the grain-growing areas of Siberia, Kazakhstan, and the Far East, as well as the cotton-growing area of Central Asia (Xb). 20/

For all of these new economic ventures the Eastern USSR will require such machinery and equipment as steam boilers, steam turbines, hydroturbines, generators, rolling mills, foundry equipment, coal cutters and loaders, mining combines, grain combines, cotton harvesting machines, pumps, compressors, hoist and transport machinery, crushing machinery, and pulp processing machinery. Many of these items are already being produced in the Eastern USSR.* It is certain, however, that the need for increased production, for new designs to be used under the diverse conditions in the Eastern USSR, and for an improved system of supply will result in the construction of new plants to produce those types of heavy machinery requiring large unit inputs of metal and large quantities of electricity. These plants probably will be built as close as possible to the consumers of their products or in a central location if they are to serve consumers over a

* See Appendix E.

S-E-C-R-E-T

S-E-C-R-E-T

widespread area. Moreover, plants for production of machine tools and metalforming equipment are to be built, possibly in time to provide the machinery and equipment going into these machine building plants.

Statements in the press have noted other types of machine building plants that are to be built in the Eastern USSR. Of the 65 plants to be built in Siberia, for example, 6 will specialize in producing parts for motor vehicles, and 6 will be centralized foundries. In addition, an electric locomotive plant and a number of shipbuilding yards will be built in Siberia.* In Kazakhstan, new plants will be built to produce diesel engines and freight vehicles. 21/

Thus, under the Sixth Five Year Plan a diversity of types of new machine building plants will be required in the Eastern USSR. Because of the importance attached in the Plan to the development of basic industries requiring heavy equipment, emphasis probably will continue to be placed principally on production of power engineering, mining, transport, agricultural, and construction machinery. At the same time, additional production of equipment for metallurgical plants, for petroleum refineries, and for the chemical industry may be anticipated.

5. Existing and Future Centers of Machine Building.

The existing machine building centers in the Eastern USSR (exclusive of the Urals Region) and the major types of machinery produced at these centers are shown in Appendix E.

Of all the regions in the Eastern USSR, West Siberia has the greatest number of cities producing machinery. Among these cities, Novosibirsk is outstanding with respect to the diversity of the machinery produced there. Most of the machine building centers are

* Although the Sixth Five Year Plan refers to "construction in Siberia and the Urals of 5 new machine tool plants, 6 metalforming equipment plants, 10 centralized foundries, 2 cutting tool plants, 3 abrasive products plants, 8 construction and road machinery plants, instrument building plants, an electric locomotive plant, and a plant to produce electrical equipment for diesel locomotives, power transformers, and high-voltage apparatus," it has not yet been possible, on the basis of Soviet information, to distribute these aggregate figures between Siberia and the Urals.

S-E-C-R-E-T

S-E-C-R-E-T

located in areas of heavy industrial concentration -- in the Kuzbas industrial area (at Kemerovo, Kiselevsk, Prokop'yevsk, and Tomsk) and in Altayskiy Kray (at Barnaul, Biysk, Rubtsovsk, and Slavgorod).

In East Siberia, production of machinery is concentrated largely in the Krasnoyarsk and Irkutsk areas, but there also is some production at Ulan-Ude and Chermkhovo. Machine building in the Far East Region is confined principally to shipbuilding at major maritime and river port cities. Power engineering machinery and agricultural machinery are produced, however, at Khabarovsk.

In Kazakhstan the most important machine building centers are Akmolinsk, Alma-Ata, Chimgent, and Karaganda; and in Central Asia, Tashkent, Chirchik, and Frunze. Kazakhstan produces several types of machinery, reflecting a more diversified economic development than that of Central Asia, which specializes in agricultural and textile machinery. Such types of machinery are produced almost exclusively for the pre-dominating cotton industry of the region.

Writing on the future development of machine building in Siberia, V.E. Popov* calls for locating new machine building centers in areas where coordinated industrial development on the pattern of the Kuzbas can be carried out. 22/ Such areas include;

a. The Krasnoyarsk industrial area, based on iron ore resources of the Angara-Pit Basin, on coal resources of the Kansk-Achinsk Basin, on water resources of the Yenisey River, and on timber resources of the lower reaches of the Angara;

b. Southern Krasnoyarskiy Kray, based on iron ore resources of the Khakasskaya Autonomous Oblast, on coal resources of the Minusinsk and Ulug-Khemskiy Basins, and on water resources of the upper reaches of the Yenisey River;

c. Altayskiy Kray, based on ore resources of Kazakhstan and on coal resources of the Kuzbas; and

d. Irkutskaya Oblast, based on iron ore resources of the Angara-Ilim Basin, on coal resources of the Irkutsk Basin, and on water resources of the Angara River.

* See p. 7, above.

S-E-C-R-E-T

Farther east, along the Amur River, another industrial area is being planned, based on iron ore resources of Aldan, on coal resources of southern Yakutskaya ASSR, and on water resources of the Argun' and Amur Rivers. 23/

On the principle of locating machine building plants not only near the resources required for production but also where these plants will have the maximum effect on the technology of the industries for which they are producing machinery, Popov suggests the following as major centers for various branches of machine building 24/:

West Siberia

Barnaul or Kamen'-on-Ob':	Agricultural machinery
Kuzbas and Kemerovo :	Mining equipment (including coal mining combines and excavators for open-pit mining) and coal-chemical equipment
Novosibirsk :	Power engineering machinery (steam turbines and hydroturbines)
Tomsk :	Instruments
Yeniseysk :	Wood processing and papermaking machinery

East Siberia

Angarsk :	Equipment for the petroleum industry and petrochemical equipment
Irkutsk :	Ships (river boats)
Minusinsk :	Machine tools, metalforming equipment, and cutting tools

It is uncertain whether or not Popov's proposals carry any official weight, even though they were printed in an official journal. In some cases, however, the places which Popov recommends as centers of production for a given type of machinery already produce that type of machinery or will soon do so.*

* See Appendixes E and F.

S-E-C-R-E-T

Appendix F and the map in Figure 3* show the new machine building plants for which specific locations and types of production are known. Most of the new Siberian machine building plants for which specific information is available are to be built in established machine building centers. In Kazakhstan, on the contrary, three major machine building plants will be located in cities which have not heretofore been important machine building centers: Petropavlovsk, Pavlodar, and Semipalatinsk. With construction of an important cable plant at Khabarovsk, this city will be a major machine building center in the Far East Region.

6. Possible Causes of Delay in the Construction Program.

In the USSR the function of deciding where new industrial plants are to be located and resources allocated nominally is centered in the planning organs of the government, primarily Gosplan (the Soviet organization concerned with long-term national economic planning) and the State Economic Commission (Gosekonomkomissiya, the Soviet organization concerned with current national economic planning). The objectives of the Five Year Plans for economic development to be carried out by the government are usually announced by the Communist Party of the USSR (CPSU) at one of its Congresses, however, and it may be assumed that directives on regional distribution of new plants reflect the CPSU policy on the subject.

Dissatisfaction over the work of Gosplan as constituted before May 1955 culminated in a reorganization "to bring about a radical improvement in the field of long-term national economic planning." 25/ At the time of the reorganization, it was stated that the function of Gosplan would consist of drafting the Five Year Plans as well as longer range plans of 10 to 15 years. The newly created Gosekonomkomissiya was to concentrate on the annual plans. The role of Gosplan with respect to regional distribution of new enterprises was described as follows 26/:

Gosplan, USSR, must plan an efficient distribution of productive capacities, taking into account the need for integrated development of economic regions, the necessity of moving enterprises closer to the sources of raw materials and to consuming regions, as well as the importance of eliminating long-distance hauls and crosshauls A decided improvement in planning

* Following p. 16, below.

S-E-C-R-E-T

S-E-C-R-E-T

the distribution of productive capacities, founded on a sound economic basis, is one of the main tasks confronting Gosplan, USSR.

Factors which Gosplan and other government organs concerned with regional development are supposed to consider in deciding the location of new plants include increased production, improved defense, and maximum productivity of labor. 27/ When these criteria conflict with each other, disputes may arise between the various governmental organs concerned.

The following criticism of Soviet governmental organs with respect to locating new plants since World War II is typical 28/:

Distribution of industrial enterprises and the practice of selecting sites for their construction in the postwar period in some cases have not answered the requirements of the law of planned, proportional development of the national economy. In a number of instances, selection of regions and sites for the construction of new industrial enterprises was made without the necessary technical and economic bases and without preliminary surveys.

Accordingly, in July 1955, the Central Committee of the CPSU decreed 29/:

That Gosplan, USSR; Gosekonomkomissiya, USSR; ministries; departments; central committees of the Communist Parties and councils of ministers in the republics; kray committees and oblast committees of the Party; and kray executive committees and oblast executive committees be obliged to improve nationwide planning of the distribution of production facilities in the country, strictly following Party directives on improving the geographical distribution of industrial enterprises, on moving industry closer to sources of raw materials and fuels and to regions of consumption, on proper specialization and integrated development of the economy of economic regions, and on more rapid development of industry in the eastern part of the country to prevent further concentration of industrial enterprises in a number of large cities.

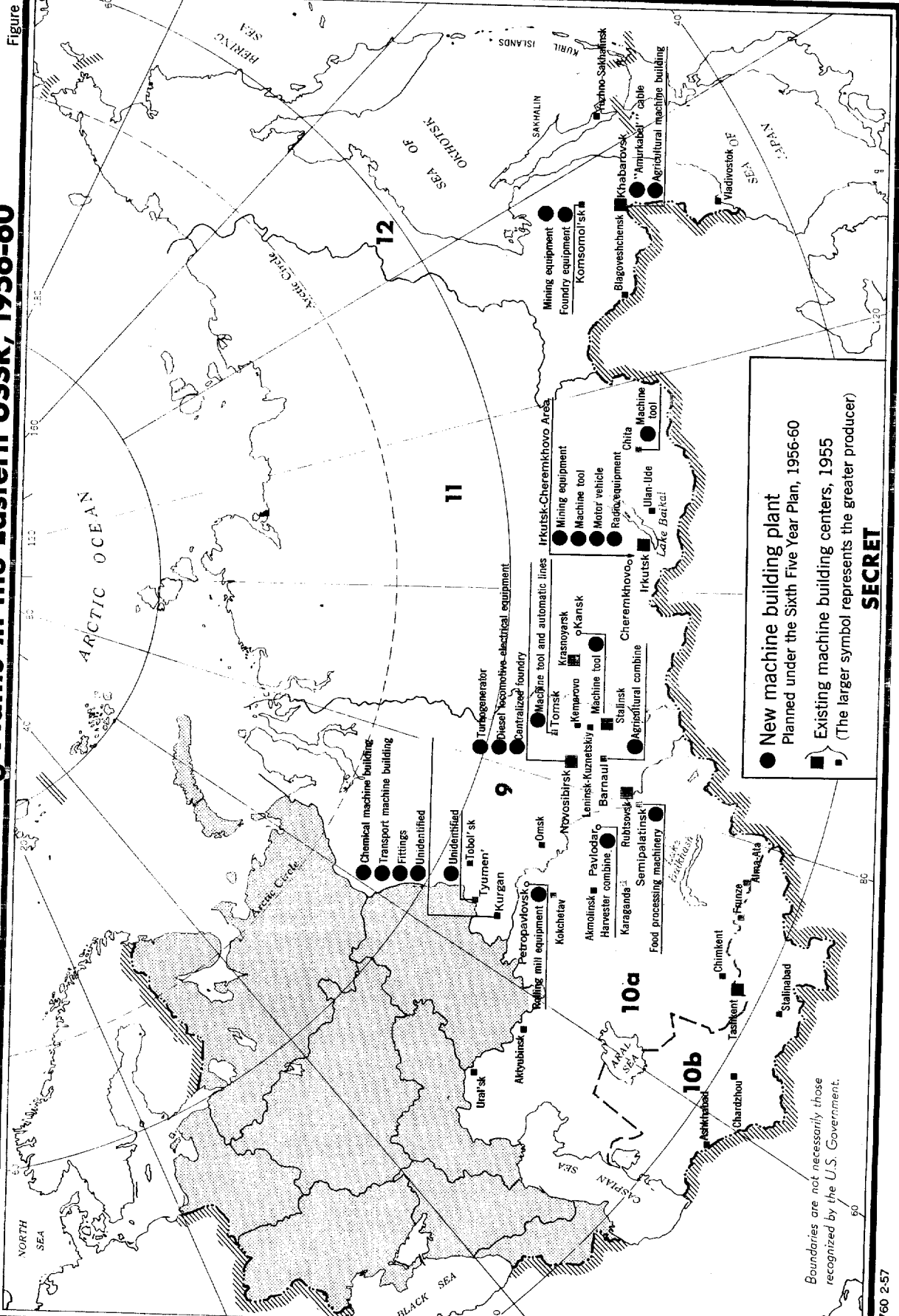
- 16 -

S-E-C-R-E-T

SECRET

New Machine Building Plants in the Eastern USSR, 1956-60

Figure



Boundaries are not necessarily those recognized by the U.S. Government.

SECRET

SECRET

S-E-C-R-E-T

Because decisions are not reached unilaterally by Gosplan and by Gosekonomkomissiya, various pressures may be brought to bear on these organizations regarding the location of new plants, thus sometimes delaying construction.

To judge from the Soviet press, the worst offenders are the ministries themselves. (Gosplan and Gosekonomkomissiya are subordinate to the Council of Ministers, USSR.) Planning the location of future plants inevitably involves differences between the long-term planners, who envisage coordinated development of whole areas, and the ministries, which are concerned with filling immediate goals for production. A ministry which wants to build a plant in a highly industrialized area where the capacities of new plants can be developed quickly is apt to be accused of "narrow departmentalism" by the planners, but the ministry may nevertheless have its way after differences have been arbitrated.

The appointment in December 1956 of M.G. Pervukhin and a group of six top-level Soviet administrators, whose combined ministerial experience encompasses all phases of the domestic economy, as chairman and deputy chairmen, respectively, of Gosekonomkomissiya may strengthen the hand of the ministries in current planning. On the other hand the increased authority given Gosekonomkomissiya under this influential group of men may severely limit the amount of pressure which individual ministries can exert on the planners in the future. The reorganization of Gosekonomkomissiya undoubtedly has led to some concentration of planning and executive functions which on the whole had been kept separate heretofore. Presumably plans which establish goals for production contingent on the completion of new plants will be more realistically drafted and more expertly implemented under the new management of Gosekonomkomissiya, with the result that antagonisms over the location of new plants may diminish somewhat. Gosplan, however, has not been affected directly by the decrees of December 1956, and it is doubtful whether the reorganization of Gosekonomkomissiya will eliminate entirely long-term planning problems connected with locating new plants in economically undeveloped areas of the USSR. 30/

Ministries have shown a decided reticence about building new plants in the Eastern USSR. In July 1955 the Central Committee of the CPSU noted that "the directives of the XIXth Party Congress concerning improvement of the geographic distribution of industrial enterprises are not being implemented satisfactorily. Some ministries are not devoting the necessary attention to construction of new enterprises

- 17 -

S-E-C-R-E-T

S-E-C-R-E-T

in the Eastern USSR." 31/ Popov* also acknowledged that the ministries had been the principal obstacle in creating "a system of specialized scientific-production centers of machine building east of the Urals to duplicate centers in the European part of the USSR." 32/ Popov also noted 33/:

Even before World War II, the question of building "duplicate" machine building plants in the East was raised in connection with paving the way for subsequent integrated development of groups of economic regions. After the war, however, ministries preferred to build new plants, including "duplicate" plants in the European USSR thus causing the machine industry of the Eastern USSR to fall behind the requirements of its economy.

According to Popov, current decisions by the ministries concerning the location of new machine building plants in Siberia are based almost exclusively on finding sites which afford transportation facilities and municipal and other improvements so that new plants can go into production as rapidly as possible. "When given a new planning assignment, designers always inquire about the possibility of locating machine building plants in Novosibirsk, Krasnoyarsk, or Barnaul." This practice, said Popov, leads to the "unsystematic" location of machine building enterprises and to their concentration in a few major cities. 34/

In reality, new manufacturing enterprises usually can achieve the desired level of output more rapidly by locating in established industrial centers than in sparsely developed areas. Established industrial centers generally have a supply of skilled labor and the necessary supporting services, such as electric power, transportation, materials, and warehouses. The interests of central planning officials concerned with the development of new economic regions for strategic purposes frequently conflict with the ministerial interests of achieving ambitious goals for production most easily. Popov's charge of "unsystematic" location, therefore, probably refers to strategic considerations.

Other pressures apparently are exerted by high CPSU officials in an effort to locate plants within their native regions. A member of the French Socialist Party delegation which recently visited the USSR made the following observation after a visit to Gosplan 35/:

* See p. 7, above.

S-E-C-R-E-T

S-E-C-R-E-T

I have the feeling that priorities in regional development depend particularly on the political influence of the different members of the Presidium of the Central Committee; each has his connections with this or that region, in which he is particularly interested and for which he will intercede. I did not find any comprehensive doctrine on the development of regional economies but merely a certain balance of power and influences

In addition to the outside pressures exerted by the ministries and by high governmental officials, the bureaucratic functioning of Soviet planning and designing organizations is often cited as the cause of delay in beginning and completing construction on schedule. Other difficulties in construction arise from the nature of the organization of Soviet construction procedures. New machine building plants in the USSR are built by specialized construction ministries on a contractual basis with the machine building ministries. The performance of these construction ministries under the Fifth Five Year Plan has been the object of frequent criticism. The machinery for shifting the activities of these ministries to new areas is cumbersome and slow. In January 1956, S. Fomin, Deputy Minister of the Machine Tool Building and Tool Industry, USSR, wrote 36/:

In connection with developing production facilities in the Eastern USSR, great importance attaches to creation of construction organizations there. The construction ministries, and especially the Ministry of Construction, USSR, which are erecting machine building enterprises must, in coordinating their plans with the future projects plan of the machine building ministries, carefully work out the problem of relocating their construction organizations and ensure their successful operation in the regions where new plants are to be built.

Several recent articles on Siberia indicate that the coordination of planning and construction, including production of building materials, is not proceeding very smoothly. It has been charged that the lack of proper coordination and supervision in Moscow creates a bottleneck. One article written from Irkutsk stated that "it is impossible to be complacent when the construction industry, ... the construction materials industry, and machine building branches which serve the builders have ceased to be part of a single complex. In our opinion, Gosplan, USSR, and Gosekonomkomissiya, USSR, should take an interest in all these problems." 37/

- 19 -

S-E-C-R-E-T

S-E-C-R-E-T

In another article, the Chairman of the Irkutskaya Oblast Planning Commission complained 38/:

Irkutskaya Oblast entered the Sixth Five Year Plan without having settled a number of major economic problems; this could lead to serious disproportions and could unjustifiably delay development of different branches of the economy.

The State Institute for Planning Cities has not completed the plan for locating industry and other branches of the economy in the Bratsk area. New enterprises are being built in the Bratsk industrial area without regard for the industrial complex as a whole.

The problems which are arising in this new economic area are the direct result of neglect and errors in long-range planning. Gosplan, USSR, and Gosekonomkomissiya, USSR, however, ignore the many manifestations of narrow departmental confusion and the scornful attitude of some ministries and departments toward solving immediate problems in the economic development of the eastern part of the country. Unless a broad, over-all viewpoint can be taken, the goals for the development of the economy of the Eastern USSR decreed by the XXth Congress of the CPSU will not be met.

Finally, the dependence of machine building on availability of raw materials, power and fuel, skilled labor, and consumers may prove another stumbling block in fulfilling the planned program. An example of what happens in a controlled economy if the development of various industries is not coordinated carefully is illustrated by the new Irkutsk Hydroelectric Power Station. A. Bochkin, construction chief of this project, wrote, in 1956 39/:

There is already a sizable lag in construction of enterprises which are to consume the cheap electric power of the new Irkutsk Hydroelectric Power Station. This year, two turbines of the Irkutsk Hydroelectric Power Station with a capacity of over 160,000 kilowatts will go into operation, but consumers will be ready to utilize not more than 50,000 kilowatts.

- 20 -

S-E-C-R-E-T

S-E-C-R-E-T

In the USSR, productive capacity often stands idle because of faulty planning or faulty implementation of plans. To prevent the accumulation of idle capacity, the construction of new machine building plants must be coordinated with that of new enterprises from which the machine building plants are to receive supplies and to which they are to deliver their products.

The problem of an industrial labor force in the Eastern USSR is also a cause of concern to Soviet planners. In the Sixth Five Year Plan, nearly 3 million workers and other employees, the equivalent of approximately one-half of the population of East Siberia, are to be moved to the Eastern USSR. 40/

A number of problems arise in connection with developing the resources of the country's eastern areas. The first of these is manpower. Within the next 2 years the new construction works in the east will require hundreds of thousands of workers, and they will be supplied by the big industrial centers that possess manpower reserves. At the new construction projects, no small part will be played by servicemen demobilized under the Soviet government's recent decision to reduce the USSR armed forces in the course of the year 1956 by 1,200,000 men. 41/

Not only is a labor force needed to build new machine building plants, but highly skilled labor is needed to operate many of them. Popov notes that several years are required to train a setup man for automatic machine tools and lines, and he insists that more attention should be given to locating Siberian machine building plants where there are maximum opportunities for creating and augmenting a permanent, highly skilled labor force. In suggesting Minusinsk as a center for production of machine tools and metalforming equipment, for example, Popov notes that conditions in southern Krasnoyarskiy Kray are favorable for attracting and holding personnel. Because of the disproportion between the tremendous size and natural resources of Siberia and its limited labor force, highly skilled personnel must be brought into the area if the new centers of machine building are to become centers not only of production but also of technology, complete with experimental bases, design bureaus, and technical schools, as envisaged. 42/

There is no reason to suppose that the program for erecting approximately 100 new machine building plants in the Eastern USSR is beyond the capabilities of the USSR. The problems which have been noted must be solved, however, before planned objectives can be achieved.

S-E-C-R-E-T

APPENDIX A

ECONOMIC REGIONS OF THE USSR

The USSR was divided into 13* well-defined economic regions before World War II in order to facilitate the work of Gosplan in planning the development of the national economy. ^{43/} There is a tendency among Soviet economists, however, to depart from these divisions when discussing the economic development of the USSR. For example, statistics on economic plans are reported most frequently on the basis of administrative-territorial divisions, whereas long-range and strategic planning make common use of such concepts as the Western regions of the USSR and the Eastern regions of the USSR.**

These latter terms are objectionable because they are ill defined. As the Soviet economy has expanded eastward, the western limits of the Eastern USSR also appear to have shifted eastward, accompanied by a change in the regional composition of the Eastern USSR. Until the end of World War II, for example, the Volga Region was invariably included under the Eastern USSR. ^{44/} Since World War II the Volga Region rarely has been referred to as a region of the Eastern USSR. In general, discussions of the Eastern USSR at present include the economic regions shown below by name and by number. There are a number of indications, however, that in long-term economic and strategic defense planning the machine building industry now may be departing from the above pattern of regional grouping to the extent that the Urals Region is no longer included in the Eastern USSR as in the past. Consequently, the Urals Region has not been included in sections of this memorandum dealing with future development of the machine building industry in the Eastern USSR.

* Although CIA map 13702 (see the second footnote on p. 1, above) shows 12 major economic regions in the USSR, Soviet sources show Regions Ia (Northwest) and Ib (North) as 2 separate major economic regions rather than as subdivisions of a single economic region.

** For simplification, these areas are referred to in this memorandum as the Western USSR and the Eastern USSR.

S-E-C-R-E-T

S-E-C-R-E-T

<u>Economic Region*</u>		
<u>Name</u>	<u>Number</u>	<u>Major Territorial-Administrative Divisions</u>
Urals	VIII	Bashkirskaya Autonomous Soviet Socialist Republic (ASSR) Chelyabinskaya Oblast Chkalovskaya Oblast Komi-Permyatskiy National Okrug Sverdlovskaya Oblast Udmurtskaya ASSR Molotovskaya Oblast
West Siberia	IX	Altayskiy Kray Kemerovskaya Oblast Kurganskaya Oblast Novosibirskaya Oblast Omskaya Oblast Tomskaya Oblast Tyumenskaya Oblast
Kazakhstan**	Xa	Kazakh SSR**
Central Asia	Xb	Kirgiz SSR Tadzhik SSR Turkmen SSR Uzbek SSR
East Siberia	XI	Buryat-Mongol'skaya ASSR Chitinskaya Oblast Irkutskaya Oblast Krasnoyarskiy Kray Tuvinskaya Autonomous Oblast Yakutskaya ASSR

* For the sake of clarity and convenience, basic economic regions have been referred to by name throughout this memorandum.

** The terms Kazakhstan and Kazakh SSR are used interchangeably in the USSR to denote the same administrative-territorial entity.

- 24 -

S-E-C-R-E-T

S-E-C-R-E-T

<u>Economic Region</u>		<u>Major Territorial-Administrative Divisions</u>
<u>Name</u>	<u>Number</u>	
Far East	XII	Amurskaya Oblast Khabarovskiy Kray Magadanskaya Oblast Primorskiy Kray Sakhalinskaya Oblast

Soviet dissatisfaction with the present system of economic regions in the USSR has been expressed on a number of occasions. At a meeting of economic geographers in Moscow in the autumn of 1955, it was proposed that several new economic regions be created and that certain existing regions be consolidated. There was general agreement that the present system had outlived its usefulness and that Gosplan should work out a new system of economic regions which would reflect more accurately the present level of economic development throughout the USSR. More recent information indicates that Gosplan and its Economic Scientific Research Institute are now engaged in drawing up a new system of economic regions for over-all long-term planning. 45/

- 25 -

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX B

SOVIET MINISTRIES
PROBABLY CONCERNED WITH THE NEW MACHINE BUILDING PLANTS
ANNOUNCED FOR THE EASTERN USSR

It is not clear whether or not the aggregate figures on the number of new machine building plants to be erected in the Eastern USSR under the Sixth Five Year Plan are limited to plants of the all-union ministries which specialize in machine building or whether or not these figures include plants of other all-union, union-republic, and republic ministries which produce a limited amount of machinery for the needs of their particular industries.

Statements in the Sixth Five Year Plan concerning the advantages of specialization in the field of machine building, as well as information on the subordination of a number of new plants,* indicate that plants referred to in the published figures will fall under the jurisdiction of some or all of the following all-union machine building ministries of the USSR:

- Ministry of the Aviation Industry
- Ministry of Construction and Road Machine Building
- Ministry of the Defense Industry
- Ministry of the Electrotechnical Industry
- Ministry of General Machine Building
- Ministry of Heavy Machine Building
- Ministry of Instrument Building and Automation Equipment
- Ministry of Machine Building
- Ministry of the Machine Tool Building and Tool Industry
- Ministry of Medium Machine Building
- Ministry of the Motor Vehicle Industry
- Ministry of the Radiotechnical Industry
- Ministry of Shipbuilding
- Ministry of Tractor and Agricultural Machine Building
- Ministry of Transport Machine Building

* See Appendix F.

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX C

TENTATIVE CLASSIFICATION OF THE MACHINE BUILDING INDUSTRY
IN THE USSR*

The list which follows represents an attempt to provide a more detailed classification of the types of machinery and equipment which may be produced at plants referred to in this memorandum, by general type, such as heavy machine building plants or agricultural machine building plants.

This tentative classification is actually a synthesis of classifications appearing in several Soviet sources although it relies heavily on one fairly comprehensive treatment of the subject. ^{46/} The principal difficulty in this classification resulted from frequent discrepancies in Soviet attempts to classify different types of equipment and machinery, particularly with respect to such subclasses as chemical and petroleum refinery equipment, textile machinery, and construction and road building machinery, which may be treated under heavy machinery, under general machinery, or independently.

It should be noted that the Soviet term machine building industry, like the European term engineering industry, includes such items as cable, electrical equipment, and radio equipment. A growing tendency toward specialization of production in the Soviet machine building industry is reflected in the decision to build a number of specialized plants for parts and processes, including plants for production of motor vehicle parts, foundries, and forging and pressing plants, under the Sixth Five Year Plan. ^{47/} These plants are considered to be bona fide machine building plants.

1. Power Engineering Machinery.

- a. Steam boilers
- b. Steam turbines
- c. Hydroturbines
- d. Locomobiles
- e. Internal combustion engines
- f. Generators
- g. Motors
- h. Transformers

* This classification covers only machinery for nonmilitary purposes.

S-E-C-R-E-T

S-E-C-R-E-T

- i. Batteries
- j. High-voltage apparatus
- k. Control apparatus
- l. Electrical instruments
- m. Electric bulbs
- n. Cable
- o. Radiotechnical equipment

2. Heavy Machinery.

a. Equipment for metallurgical plants

- (1) Hoisting winches
- (2) Ladles
- (3) Casting machines
- (4) Charging machines for Martin furnaces
- (5) Steel casting cranes
- (6) Rolling mills
- (7) Blooming mills

b. Mining equipment

- (1) Hoisting machinery
- (2) Compressors
- (3) Cutting machines
- (4) Loading machines
- (5) Mining combines

c. Equipment for the petroleum industry

3. Machine Tools.

- a. Metalcutting machine tools
- b. Woodworking machine tools
- c. Metalforming equipment
- d. Cutting and grinding tools
- e. Mechanical instruments

- 30 -

S-E-C-R-E-T

S-E-C-R-E-T

4. Transport Machinery.

a. Locomotives and railroad cars

- (1) Steam locomotives
- (2) Diesel locomotives
- (3) Electric locomotives
- (4) Freight cars
- (5) Passenger cars

b. Motor vehicles

- (1) Trucks
- (2) Passenger cars

c. Ships

d. Aircraft

5. Agricultural Machinery.

- a. Implements for working the soil (plows, harrows, and the like)
- b. Seeding and planting machines
- c. Machines and implements for taking care of plants (cultivators and the like)
- d. Harvesting machines (combines, reapers, mowers, and the like)
- e. Grain-cleaning machines
- f. Tractors
- g. Machines for hay harvesting and for work on livestock farms
- h. Tree-planting machines

6. Construction and Road Machinery.

- a. Excavators
- b. Tractor scrapers
- c. Bulldozers

7. General Machinery.

- a. Chemical equipment
- b. Textile machinery
- c. Timber-felling, sawmill, and wood-processing machinery
- d. Food-processing machinery
- e. Printing machinery
- f. Papermaking machinery

- 31 -

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX D

DETERMINATION OF THE LOCATION OF MACHINE
BUILDING PLANTS IN THE USSR

According to Table 1*, a reproduction of a table compiled by A.G. Omarovskiy of the Economic Scientific Research Institute of Gosplan, 48/ the availability of electric power is the one factor on which the location of all 26 types of machine building (excluding repair enterprises) shown in the table is at least relatively dependent. Dependence on electric power is listed as a primary factor, however, for only nine types of machine building. Proximity to consumers is the primary factor most frequently mentioned, being listed for 13 types, followed by proximity to raw materials, which is listed for 11 types of machine building.

Soviet planners recognize that the relative importance of various economic factors change with the technology of machine building. Thus the development of processes of production which require heavy consumption of electricity (electric welding, high-frequency tempering, electric-spark surface finishing, electric annealing, and electric drying) has increased the importance of abundant sources of electricity.

* Table 1 follows on p. 34.

S-E-C-R-E-T

S-E-C-R-E-T

Table 1

Economic Factors Determining the Location
of Machine Building Plants in the USSR a/

Type of Machinery Produced	Raw Materials	Fuel (Technological)	Electric Power	Transportation	Consumer
Machine tools	+	+	+	+	+
Heavy machine tools	++	+	+	++	++
Cutting and grinding tools	-	-	+	-	-
Turbines	+	+	+	+	+
Boilers	++	+	++	++	++
Heavy machinery (for rolling mills)	++	++	+	++	++
Chemical equipment	++	+	+	++	++
Coal machinery	+	+	+	+	++
Petroleum machinery	++	+	+	+	++
Transport machinery (rolling stock)	++	++	++	-	+
Motor vehicles	+	+	++	+	-
Construction and road machinery (excavators)	++	+	++	++	+
Tractors	+	+	++	++	++
Agricultural machinery	++	+	++	++	++
Light machinery	-	-	+	+	+
Food processing machinery	-	-	+	+	+
Electrical machinery	+	-	+	+	-
Instruments	-	-	+	-	-
Precision machinery	-	-	+	-	-
Diesel engines	+	+	+	+	-
Motors and components	+	+	++	+	++
Forgings, stampings, and castings	++	++	++	+	++
Cable	++	-	+	+	-
Aircraft	-	+	+	-	++
Radio technical equipment	++	+	+	+	+
Ships	++	+	++	+	++
Repair enterprises	-	-	-	++	++

a. The degree of dependency is indicated by symbols with the following significance: ++ equals dependent; + equals relatively dependent; - equals relatively independent.

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX E

CENTERS OF MACHINE BUILDING IN THE EASTERN USSR*
UNDER THE FIFTH FIVE YEAR PLAN**
(1951-55)

Table 2

<u>Economic Region</u>	<u>Machine Building Center</u>	<u>Major Types of Machinery Produced</u>
West Siberia	Barnaul	Boilers, rolling stock, metal-forming equipment
	Biysk	Boilers, electric furnaces
	Kemerovo	Construction and road machinery
	Kiselevsk	Mining equipment
	Kurgan	Agricultural machinery
	Novosibirsk	Power engineering machinery, machine tools, metalforming equipment, cutting tools, agricultural machinery
	Omsk	Agricultural machinery
	Prokop'yevsk	Mining equipment
	Rubtsovsk	Agricultural machinery, including tractors
	Slavgorod	Metallforming equipment
Kazakhstan	Tomsk	Cutting tools
	Tyumen'	Construction machinery
	Akmolinsk	Agricultural machinery
	Alma-Ata	Heavy machinery
	Chimkent	Metallforming equipment
Central Asia	Karaganda	Mining equipment
	Chirchik	Agricultural machinery
	Frunze	Agricultural machinery
East Siberia	Tashkent	Agricultural machinery, textile machinery
	Cheremkhovo	Mining equipment
	Irkutsk	Heavy machinery, machine tools

* Exclusive of the Urals Region.

** This list covers only machinery for nonmilitary purposes. There are also a number of aircraft and armaments plants located in the Eastern USSR. 49/

- 35 -

S-E-C-R-E-T

S-E-C-R-E-T

Table 2
(Continued)

<u>Economic Region</u>	<u>Machine Building Center</u>	<u>Major Types of Machinery Produced</u>
Far East	Krasnoyarsk	Heavy machinery, rolling stock, agricultural machinery
	Ulan-Ude	Rolling stock
	Khabarovsk	Power engineering machinery, ships, agricultural machinery
	Vladivostok	Ships
	Komsomol'sk-on-Amur	Ships
	Nikolayevsk-on-Amur	Ships

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX F

SOME MACHINE BUILDING PLANTS TO BE BUILT IN THE EASTERN USSR*
UNDER THE SIXTH FIVE YEAR PLAN
(1956-60)

Table 3

<u>Economic Region</u>	<u>Location of Plant</u>	<u>Plant</u>
West Siberia <u>a/</u>	Barnaul	Agricultural Combine Plant
	Kurgan	Chemical Machine Building Plant <u>b/</u>
		Kurgan Fittings Plant <u>b/</u>
		Kurgan Machine Building Plant <u>c/</u>
		Unidentified Plant <u>d/</u>
	Novosibirsk	Diesel Locomotive Electrical Equipment Plant
		Turbogenerator Plant <u>e/</u>
		Centralized Foundry
	Tomsk	Machine Tool and Automatic Lines Plant <u>d/</u>
Kazakhstan <u>f/</u>	Tyumen'	Unidentified Plant <u>d/</u>
	Pavlodar	Harvester Combine Plant
	Petropavlovsk	Rolling Mill Equipment Plant <u>g/</u>
	Semipalatinsk	Food Industry Machinery Plant <u>b/</u>
East Siberia <u>h/</u>	Chita	Machine Tool Plant
	Kansk	Machine Tool Plant
	Irkutsk-Cheremkhovo	Machine Tool Plant
		Motor Vehicle Plant
		Radio Equipment Plant
Far East <u>j/</u>		Mining Equipment Plant <u>i/</u>
	Khabarovsk	"Amurkabel'" Cable Plant
		Agricultural Machine Building Plant
	Komsomol'sk	Foundry Equipment Plant
		Mining Machinery Plant

a. 50/

b. Subordinate to the Ministry of Machine Building.

* Exclusive of the Urals Region.

S-E-C-R-E-T

S-E-C-R-E-T

Table 3
(Continued)

-
- c. Subordinate to the Ministry of Transport Machine Building.
 - d. Subordinate to the Ministry of the Machine Tool Building and Tool Industry.
 - e. Subordinate to the Ministry of the Electrotechnical Industry.
 - f. 51/
 - g. Subordinate to the Ministry of Heavy Machine Building.
 - h. 52/
 - i. Located at Usol'ye Sibirskoye.
 - j. 53/

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX G

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation of the cited document.

- 25X1A8a 1. Planovoye khozyaystvo, no 2, 1956, p. 76. U. Eval. RR 2.
2. Ibid., p. 77, 84. U. Eval. RR 2.

- 25X1A8a9 3. Planovoye khozyaystvo, no 2, 1956, p. 80. U. Eval. RR 2.
4. Ibid., p. 84. U. Eval. RR 2.
5. Ibid., p. 24. U. Eval. RR 2.
6. [REDACTED]

Izvestiya akademii nauk SSSR, Seriya geograficheskaya, no 3, 1956, p. 49. U. Eval. RR 2.

- 39 -

S-E-C-R-E-T

S-E-C-R-E-T

7. Izvestiya akademii nauk SSSR (6, above), p. 48. U. Eval. RR 2.
8. Ibid., no 4, 1956, p. 68. U. Eval. RR 2.
9. Planovoye khozyaystvo, no 2, 1956, p. 79. U. Eval. RR 2.
9. Livshits, R.S. Ocherki po razmeshcheniyu promyshlennosti SSSR (Outline of the Distribution of USSR Industry), Moscow, 1954, p. 178. U. Eval. RR 2.
- Voznesenskiy, N.A. Economic Results of the USSR in 1940 and the Plan of National Economic Development for 1941, Moscow, p. 30-31. U. Eval. RR 2.
- Voznesenskiy, N.A. War Economy of the USSR in the Period of the Patriotic War, Moscow, 1948, p. 30-46, 63-72. U. Eval. RR 2.
- USSR, Embassy, Washington. The Great Stalin Five-Year Plan for the Restoration and Development of the National Economy of the USSR for 1946-1950, 1946, p. 2-4, 8-9. U. Eval. Doc.
- USSR. Directives of the XIXth Party Congress for the Fifth Five Year Plan of the Development of the USSR in 1951-1955, Moscow, 1952, p. 13. U. Eval. Doc.
10. Vestnik mashinostroyeniya, no 3, 1956, p. 72-75. U. Eval. RR 2.
11. USSR, Embassy, London. Directives of the Sixth Five Year Plan of the USSR, 1956-1960, Mar 56, p. 53. U. Eval. Doc.
- USSR, Embassy, London. Soviet News, 18 Sep 56, p. 1. U.

25X1A8aD

12.

13. Ibid., 2 Nov 56, p. DD 2. OFF USE. Eval. RR 3.
14. Sovetskaya Rossiya, 30 Sep 56, p. 4. U. Eval. RR 2.
15. CIA. FDD U-8082, 2 Apr 56, Outline of the Distribution of USSR Industry, p. 2, 5. OFF USE. Eval. RR 2. (Excerpts from Ocherki po razmeshcheniyu promyshlennosti SSSR, Moscow, 1954. U)

25X1A8a

16. Trud, 22 Mar 56, p. 2. U. Eval. RR 2.
- 17.

18. Planovoye khozyaystvo (5, above).
- Promyshlenno-ekonomicheskaya gazeta, 6 Jun 56, p. 2. U. Eval. RR 2.
- USSR. SSSR, administrativno-territorial'noye deleniye soyuznykh respublik (The Administrative-Territorial Division of the Union Republics of the USSR), Moscow, 1954, p. 273. U. Eval. Doc.
19. Voprosy ekonomiki, no 9, 1956, p. 156 (map). U. Eval. RR 3.
20. USSR, Embassy, London. Directives of the Sixth Five Year Plan of the USSR, 1956-1960 (11, above), p. 93-102. U. Eval. Doc.
- ECE. Electric Power Working Paper no 79, Hydroelectric Construction in the Soviet Union, 12 Oct 56, p. 3. U. Eval. RR 2.
- Voprosy ekonomiki, no 9, 1956, p. 155-159. U. Eval. RR 2.

- 40 -

S-E-C-R-E-T

S-E-C-R-E-T

25X1A8a

21. Promyshlenno-ekonomicheskaya gazeta (18, above).
Trud, 22 Mar 56, p. DD 2. OFF USE. Eval. RR 3.
- [REDACTED]
22. Vestnik mashinostroyeniya (10, above), p. 73. U. Eval. RR 2.
23. USSR, Embassy, London. Soviet Weekly, 20 Sep 56, p. 1. U. Eval. RR 2.
24. Vestnik mashinostroyeniya (10, above), p. 74-75. U. Eval. RR 2.
25. CIA. [REDACTED] Reorganization of Gosplan USSR and Improvement of National Economic Planning, 20 Jan 56, info 1955, p. 1-3. OFF USE. Eval. RR 2. (tr of Planovoye khozyaystvo, no 3, 1955. U)
26. Ibid.
27. CIA. FDD U-8082 (13, above), p. 6. OFF USE. Eval. RR 2.
28. Ibid., p. 11. OFF USE. Eval. RR 2.
29. USSR. Postanovleniya tsentral'nogo komiteta KPSS i soveta ministrov SSSR po voprosam promyshlennosti i stroitel'stva, 1952-1955 (Decrees of the Central Committee of the CPSU and the Council of Ministers USSR on Problems of Industry and Construction, 1952-1955), Moscow, 1956, p. 22-23. U. Eval. Doc.
30. Pravda, 25 Dec 56, p. 1, 2. U. Eval. RR 2.
- Ibid., 26 Dec 56, p. 3. U. Eval. RR 2.
- State, Moscow. Dsp 357, 11 Jan 57. C. Eval. RR 2.
31. USSR. Postanovleniya tsentral'nogo komiteta KPSS i soveta ministrov SSSR po voprosam promyshlennosti i stroitel'stva, 1952-1955 (29, above), p. 22. U. Eval. Doc.
32. Vestnik mashinostroyeniya (10, above), p. 75. U. Eval. RR 2.
33. Ibid., p. 73. U. Eval. RR 2.
34. Ibid., p. 74. U. Eval. RR 2.
35. Manchester Guardian, 3 Aug 56. U. Eval. RR 2. (Extract from report by M. André Philip appearing in the Bulletin of the Société d'Etudes et de Documentation Economiques, Industrielles, et Sociales).
36. Stroitel'naya gazeta, 29 Jan 56, p. 3. U. Eval. RR 2.
37. Pravda, 14 May 56, p. 2. U. Eval. RR 2.
38. Pravda, 1 Jul 56, p. 2. U. Eval. RR 2.
39. Pravda, 14 May 56 (37, above).
40. Stroitel'naya gazeta, 1 Apr 56, p. 3. U. Eval. RR 2.
- Izvestiya akademii nauk SSSR (6, above), p. 77. U. Eval. RR 2.


25X1A8a

41. USSR, Embassy, London. Soviet News (40, above).
42. Vestnik mashinostroyeniya (32, above).
43. Izvestiya akademii nauk SSSR (6, above), no 2, 1956, p. 88, 163. U. Eval. RR 2.
- Shimkin, D.B. "Economic Regionalization in the Soviet Union," The Geographical Review, vol 42, no 4, Oct 52, p. 599. U. Eval. RR 2.

- 41 -

S-E-C-R-E-T

S-E-C-R-E-T

44. Voznesenskiy, N.A. War Economy of the USSR in the Period of the Patriotic War (9, above).
45. Izvestiya akademii nauk SSSR (6, above), no 2, 1956, p. 163.
U. Eval. RR 2.
46. Planovoye khozyaystvo, no 6, 1956, p. 37. U. Eval. RR 2.
46. Stepanov, P.N. Geografiya promyshlennosti SSSR (Geography of USSR Industry), 2d ed., Moscow, 1955, p. 142-164. U. Eval. RR 2.
- CIA. FDD Translation no 566, 29 Jun 56, The National Economy of the USSR, a Statistical Compilation, p. 41-46. OFF USE.
Eval. RR 2.
47. Izvestiya akademii nauk SSSR (6, above), p. 42. U. Eval. RR 2.
47. USSR, Embassy, London. Directives of the Sixth Five-Year Plan of the USSR, 1956-1960 (11, above), p. 73-74. U. Eval. RR2.
48. Izvestiya akademii nauk SSSR (6, above), p. 42. U. Eval. RR 2.
49. Stepanov, op. cit. (46, above), p. 139-168. U. Eval. RR 2.
49. Livshits, op. cit. (9, above), p. 175-188, 295-300, 329-335. U. Eval. RR 2.
- CIA. CIA/RR IM-429, Implications of the Planned Expansion in the Soviet Machine Tool and Metalforming Machinery Industries, 1 May 56, Figure 2, following p. 10. S.
- CIA. CIA/RR 48, Production of Agricultural Machinery in the USSR, 5 Jan 55, Figure 9, following p. 82. S/US ONLY.
- CIA. CIA/RR 21, The Coal Mining Equipment Industry of the USSR, 27 May 53, Figure 16, following p. 295. S.
- CIA. CIA/RR 27, Production of Locomotives and Rolling Stock in the USSR and European Satellites, 31 Dec 53, Figures 1 and 2, following p. 34. S/US ONLY.
50. Promyshlenno-ekonomicheskaya gazeta (18, above).
Ibid., 15 Jun 56, p. 2. U. Eval. RR 2.
Ibid., 23 May 56, p. 4. U. Eval. RR 2.
Stroitel'naya gazeta, 17 Jun 56, p. 1. U. Eval. RR 2.
Ibid., 29 Jan 56, p. 3. U. Eval. RR 2.
Pravda, 13 Aug 56, p. 2. U. Eval. RR 2.
51. Promyshlenno-ekonomicheskaya gazeta, 23 May 56, p. 1. U. Eval. RR 2.
- USSR, Embassy, London. Directives of the Sixth Five Year Plan of the USSR, 1956-1960 (11, above), p. 74. U. Eval. RR 2.
- Kazakhstanskaya pravda, 15 Jun 56, p. 1. U. Eval. RR 2.
- CIA. FDD Summary no 998, 18 Jul 56, Transportation, Communications, Electric Power, and Construction in USSR (No. 24), p. 85. OFF USE.
Eval. RR 2.
52. 
- Pravda, 20 May 56, p. 3. U. Eval. RR 2.

25X1A8a

S-E-C-R-E-T

53. Trud. 5 Sep 56, p. 4. U. Eval. RR 2. 25X1A8a

25X1A8a0260002-

- 43 -

S-E-C-R-E-T

S-E-C-R-E-T

S-E-C-R-E-T